

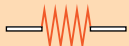
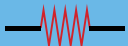
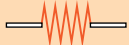
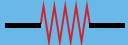
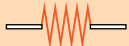
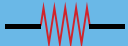


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## Resistor Comparison

**A carbon fibre cable is not a metal resistor!**

Carbon fibre	Metal
100W	100W
	
+110°C	+80°C
Efficiency: +40%	
100W	100W
	
+80°C	+80°C
6 minutes	10 minutes
Consumption: -40%	
60W	100W
	
+80°C	+80°C
Energy savings: 40%	

## Carbon Fibre Heating Technology Cost-Effective - High-Tech - Environment Friendly



The absence of electro-magnetic fields is confirmed by Istituto Giordano s.p.a. (Certificate no. 212656)

Thermal Technology® is a leading designer and manufacturer of innovative carbon fibre heating systems since 2001.

Advanced research allows us to implement highly efficient, ultra-flexible solutions targeted both at the manufacturing and at the building and sports industry. The levels of efficiency and competitiveness are confirmed by major certifying institutions and prestigious European universities.

Carbon fibre is the high-performance component which lies behind Thermal Technology®'s patented power heating systems.

### The advantages of carbon fibre:

- NON-METAL resistor
- low power conductivity (997 times lower than copper)
- low heat conductivity (3 times lower than copper)
- low density (3.7 times lower than copper)
- high specific heat (1.87 times higher than copper)
- very high resistivity (2,060 times higher than copper)

### All this results in:

- no electro-magnetic fields
- no thermal inertia
- ability to store considerable amounts of heat
- ability to let out stored heat very quickly.

# Insulation Blankets for 1000 l Tanks



These insulation blankets by Thermal Technology® are ideal to pre-heat liquids for industrial use or to keep them at a steady temperature, e.g. during the winter.

## CONSTRUCTION:

- Outer electric blue PVC fabric (cl.1).
- Internal insulation with 3 felt and aluminium layers
- Carbon fibre heating cable.
- Container-side aramid layer.
- 0.5 m neoprene power cable with IP68 plug.
- Metal mesh earthing.
- Velcro strap with 3 elastic tensioners per perfect fit.
- Recess for NTC10K temperature probe.
- Provided with an insulated PVC upper cover extending 30 cm downwards, with velcro straps on the sides and in the middle.
- Fire-resistant and/or self-extinguishing construction.
- Also suitable for outdoor use in a roofed environment.
- Additional container surface temperature control by electronic unit adjustable from 0 to 90°C (not included).

## SPECIFICATIONS:

- Carbon fibre resistors.
- Voltage: 230 VAC
- Power: 1800Watt/3000Watt (depending on the version).
- Weight: Blanket: 5 kg, Cover: 2.5 kg, Control unit: 1.5 kg.
- Temperature: 0 to 90°C\* (electronic control unit not included).
- Dimensions: Full blanket length (bxh) 440x100 cm; Cover 125x105x30 cm.
- Protection level: IP65
- 0.5 long power cable with IP68 plug.
- Marking: CE.
- Guarantee: 24 months (see User Manual).

\* The actual target surface temperature depends on environmental conditions and on the type of material or product being heated

## ELECTRONIC CONTROL:

- Mounted on a plastic box, can either be fixed to the wall or left loose.
- 3 m power cable with 230V connector plug.
- Weight: 1.5 kg.

Code	Product
TI_CIST	440x100 cm insulation blanket for small tanks. 1800 W
TI_CIST_P	440x100 cm insulation blanket for small tanks, 3000 W
T602.A	Control unit for insulation covers for industrial use with IP68 circular connector
T751	DIN-rail heat regulator, 16A OUT relay (no probe)
T756	Temperature control panel heat regulator IN NTC/KTY81 OUT relay 8A

# Insulation Blankets for Drums



Thermal Technology®'s insulation blankets for drums are suitable whenever the heating or temperature maintenance (max. 90°C) of substances contained in metal or plastic tanks are required.

Heated fluids include liquids such as oil, chemical compounds, etc., viscous materials such as paints, glues, resins etc., or gases (CO<sub>2</sub>, etc.) except gaseous fuels.

Insulation blankets may be used to:

- protect liquids from freeze or gases from liquefaction
- control viscosity variations of fluid foodstuffs (honey, ham, syrups, etc.) or non-foodstuff products
- melt down low melting point solids (chocolate, resins, glues, etc.)

## Flexible and sturdy

The heating surface is in RTV silicon treated aramid. Resistors are made of vertically arranged carbon fibres. Blankets are insulated with a double layer of fire-resistant felt.

## Low consumption

Thanks to their special construction and to carbon fibre resistors, our blankets guarantee up to 40% energy savings.

## Multi-purpose

Velcro fastening makes our heating blankets suitable for drums of several different sizes.

The surface temperature of the container may be easily pre-set on a compact electronic control unit and an optional probe controls the inside temperature from 0 to 90°C. A 90x70 mm control unit is incorporated in a shock-proof orange fastening strap.

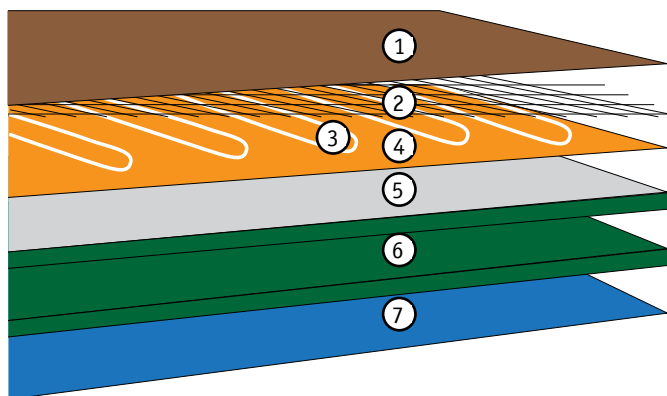
In TI\_F.D blanket models the control unit is installed outside.

## CONSTRUCTION:

- Outer electric blue PVC fabric (cl.1).
- Vertical 15 cm large orange PE fastening strap with recessed control unit.
- Elastic tensioners help closer fit.
- Velcro fastening with diameter shift options up to 8 cm.
- Double insulation in fire-resistant felt with reflective aluminium coat on one side.
- Metal mesh earthing.
- Wiring side in double-layer aramid incorporating carbon fibre resistors, RTV silicon treated.
- Container surface temperature control by electronic unit adjustable from 0 to 90°C.
- Content temperature control by optional TI\_S.A.000 probe (versions A,B,C only).
- 90°C safety thermostat.
- 5 m neoprene power cable with 16A connector plug (versions A-B-C only).

Code	Diameter (cm)	Dimensions (cm)	Power	Temperature control	Max. temp.
TI_F.A.C00	cm 28/35	90/112xh42	440W	RECESSED CONTROL UNIT	90°C
TI_F.B.C00	cm 35/43	112/135xh42	660W	RECESSED CONTROL UNIT	90°C
TI_F.C.C00	cm 43/56	150/175xh42	880W	RECESSED CONTROL UNIT	90°C
TI_F.D.000	cm 57/65	186/205x60h	1500W	v	90°C





#### LAYER ANALYSIS (inside to outside):

1. RTV silicon treated aramid.
2. Metal mesh earthing.
3. Carbon fibre heating cable.
4. Aramid fabric.
5. Fire-resistant aluminium coated insulating material.
6. Fire-resistant insulating material.
7. Outer electric blue PVC fabric (cl.1).

#### DRUM BLANKET SPECIFICATIONS:

- Carbon fibre resistors.
- Voltage: 230 VAC
- Power: 440 to 1500 W depending on the model.
- Temperature range: 0-90°C
- Dimensions: diameter from 28 to 65 cm and height from 42 to 60 cm.
- Adjustment: from 0 to 90°C\* by electronic unit.
- Protection level: IP65
- Marking: CE.
- Guarantee: 24 months (see User Manual).

\* The target surface temperature depends on environmental conditions and on the type of material or product being heated

Code	Product
T602.A	Control unit for insulation covers for industrial use with IP68 circular connector
TI_S.A.000	NTC temperature sensor mounted on a 50 cm stainless steel rod

## Bottom Heaters for 200 l Drums



#### CONSTRUCTION:

This round-shaped steel sheet drum bottom heater may be used either as a stand-alone solution or combined with a Thermal Technology® insulation blanket.

The bottom surface temperature is adjusted from 0 to 120°C by means of an electronic control unit.

- A 100 cm cable connects the bottom heater with the control unit and a 300 cm one connects the control unit with the 230V 16A connector plug.
- Shock-proof output power cable.
- Reflective heat insulating surface.
- Fibreglass insulation.

#### DRUM BOTTOM HEATER SPECIFICATIONS:

- Carbon fibre resistors.
- Voltage: 230 VAC
- Power: 500W.
- Temperature range: 0-120°C
- Dimensions: diameter 54 cm, thickness 4 cm.
- Adjustment: by electronic control unit.
- Overall weight including control unit and cable: 12 kg
- Max. load capacity: 300 kg
- Protection level: IP56.
- Marking: CE.
- Guarantee: 24 months (see User Manual).

Code	Product
PEFU.A.000.000	Bottom Heater for 200 l Drums

# Modular Anti-Freeze Insulation Blankets for Pipes



The Modular Anti-Freeze Insulation Blankets for indoor and outdoor pipes by Thermal Technology® are available in 3 length modules: 1 x 2.11, 1 x 3.62, 1 x 5.13 m.

The modules are interconnected by means of special connector terminals. The heating surface is about 8 cm wide and extends over the full module length. The overall blanket width is 30 cm and can be wrapped around pipes with a diameter range of 35 to 80 mm.

The system is powered through a 6 m long cable extension with an IP68 protected F-connection and a 16A connector plug.

Wherever heating is not necessary, e.g. around clamps or bends, the blanket can be cut and shaped to fit the pipe (see picture on the left).

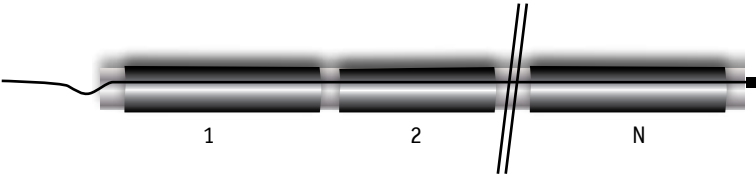


### CONSTRUCTION:

- Outer electric blue PVC fabric (cl. 1) with velcro straps.
- Double layer reflective insulation.
- Wiring side with carbon fibre resistors and connecting cable protected by a red nylon lining.

### SPECIFICATIONS:

- Carbon fibre resistors.
- Voltage: 230V
- Power and dimensions: see table below.
- Temperature adjustment by 7-13°C thermostat.
- IP67 protected connectors.
- 6 m long cable extension with IP67 protected F-connection and 16A connector plug.
- Protection level: IP65
- Fire behaviour: self-extinguishing.
- Marking: CE.
- Guarantee: 24 months (see User Manual).



Code	Dimensions (cm)	Power
TIM_T.A.T00	210x30	100W
TIM_T.B.T00	360x30	110W
TIM_T.C.T00	510x30	155W

Code	Product
TIM_T.PL06	6 m cable extension.

# Heating Wraps for Pipes



The pipe insulation wraps by Thermal Technology® apply to pipes with a diameter range of 40 to 100 mm installed both indoors and outdoors, except in explosion hazardous environments. Insulation wraps are stretched around the pipe and fastened by means of velcro straps (see picture).

### CONSTRUCTION:

- Flame-retardant outer electric blue PVC fabric (cl.1).
- Fire-resistant felt insulation with reflective aluminium coat on one side.
- Electric part in nylon fabric with added Carbon Fiber cables with copper mesh armature, PVC sheath.
- 4 m long neoprene power cable without connector.

### SPECIFICATIONS:

- Carbon fibre resistors
- Voltage: 230 VAC
- Power: 310W
- 13°C or 40°C thermostat
- Protection level: IP67
- Marking: CE.
- Guarantee: 24 months (see User Manual).

Sample path of a 1 m insulation blanket

Pipe diameter (mm)	Overall length (cm)
40	840
60	550
80	400
100	340

Code	Size	Power	Temperature control
TI_T.A.T00	1000X10cm	310W	BY 40°C THERMOSTAT

# ATEX II 3G Insulation Blankets



LPG cylinders used for heating, lighting or other purposes generally contain a mixture of gases which react differently to temperature shifts. The gas mixtures contained in gas cylinders are mainly made up of butane and propane in definite proportions. Propane tends to freeze at ca.  $-40^{\circ}\text{C}$ , whereas butane freezes at  $0^{\circ}\text{C}$ . This means that each time ambient temperature goes below  $0^{\circ}$ , LPG cylinders tend to run out very fast as the butane portion remains frozen on the bottom. Increasing depressurization due to gas extraction makes the process even faster.

The ATEX II 3G insulation blankets are easily applied on all 15-20-25 kg cylinders: the blanket diameter is adjustable thanks to special velcro bands (see picture).

Heating cables are made in carbon fibre.

The 3 m long power cable is equipped with a 2P+T 16A connector plug (IP44 protected) and flame-retardant guard.

The ATEX II 3G blanket temperature is maintained at  $60^{\circ}\text{C}$ : this allows the gas to be supplied at the ideal pressure so that optimal burning is guaranteed even with low outside temperatures. The gas contained in the cylinder is therefore almost completely used up before returning it for fill-up.

## SPECIFICATIONS:

- Carbon fibre resistors
- Voltage: 230 VAC
- Power: 700W.
- Cylinder size options: 15/20/25 kg.
- Compatible with all UNI-EN1442 containers.
- Size: 135x42 cm
- Heating surface size: 110x42 cm.
- $60^{\circ}$  double thermostat (target blanket temperature).
- Marking: CE, ATEX EX II 3G.
- $75^{\circ}\text{C}$  thermal cut-off.
- In-built metal mesh.
- Earthing.
- Silicon-coated aramid inside and outside.
- 1-layer thermal insulation.
- Velcro strap.
- 3 m long power cable with 2P+T 16A connector plug (IP44 protected) and flame-retardant guard.
- Nylon fabric bag packaging.
- Shock-resistant.
- Guarantee: 24 months (see User Manual)

Code	Product
TI_GAS	ATEX II 3G certified gas cylinder insulation blanket



# ATEX II 3G Insulation Blankets for Drums



The ATEX II 3G Insulation Blankets for Drums by Thermal Technology® are easy and quick to apply on drums and tanks thanks to velcro strap fastenings which allow you to adjust the blanket diameter as needed (see picture).

## CONSTRUCTION:

- Outer silicon-coated flame-retardant grey aramid.
- 15 cm vertical fastening band.
- Elastic tensioners help closer fit.
- Velcro fastening with diameter shift options up to 8 cm.
- Double insulation in fire-resistant felt with reflective aluminium coat on one side.
- Metal mesh earthing.
- Wiring side in aramid fabric incorporating carbon fibre resistors, RTV silicon treated.
- Drum surface temperature control by 60°C thermostat.
- 60°C safety thermostat
- 3 m neoprene power cable with 16 A connector plug and flame-retardant guard.

## SPECIFICATIONS:

- Voltage: 230 VAC
- Power absorption: depending on blanket size (see table).
- Size: depending on container size (see table).
- 60° double thermostat (target blanket temperature).
- Thermal cut-off.
- In-built metal mesh.
- Earthing.
- Silicon-coated aramid inside and outside.
- Carbon fibre resistors.
- 1-layer thermal insulation.
- Velcro strap.
- 3 m long power cable with 2P+T 16A connector plug (IP44 protected) and flame-retardant guard.
- Nylon fabric bag packaging.
- Shock-resistant.
- Marking: CE, ATEX EX II 3G.
- Guarantee: 24 months (see User Manual).



Code	Diameter (cm)	Height (cm)	Power
TI_F.A.TA0	28/35	42	440W
TI_F.B.TA0	35/43	42	660W
TI_F.C.TA0	48/56	42	880W

# ATEX II 3G Insulation Blankets for Large Tanks



LPG tanks used for heating, cooking or other purposes generally contain a mixture of gases which react differently to temperature shifts. The gas mixtures contained in gas tanks are mainly made up of butane and propane in definite proportions. Propane tends to freeze at ca.  $-40^{\circ}\text{C}$ , whereas butane freezes at  $0^{\circ}\text{C}$ . This means that each time ambient temperature goes below  $0^{\circ}$ , LPG tanks tend to run out very fast as the butane portion remains frozen on the bottom. The Insulation Blankets for Large Tanks by Thermal Technology® are easily and quickly applied to all 3000, 4000, and 5000 l tanks. The system temperature is maintained at  $60^{\circ}\text{C}$ : this allows the gas to be supplied at the ideal pressure so that optimal burning is guaranteed even with low outside temperatures. The gas contained in the tank is then used up almost completely.

## SPECIFICATIONS (for each heating band):

- Carbon fibre resistors.
- Voltage: 230 VAC
- Absorption: 400W.
- Size: 180x45 cm
- $60^{\circ}$  double thermostat (target blanket temperature).
- Tank sizes: 3000/4000/5000 l. (3, 4, and 5 heating bands, respectively).
- $75^{\circ}\text{C}$  thermal cut-off.
- Silicon-coated aramid inside and outside.
- In-built metal mesh earthing.
- 1-layer thermal insulation.
- 4 m long power cable with 2P+T 16A connector plug (IP44 protected) and flame-retardant guard.
- Shock-resistant.
- Marking: CE, ATEX EX II 3G.
- Guarantee: 24 months (see User Manual).



Code	Product
TI_SERB_GAS	ATEX II 3G certified gas tank insulation blanket

# Heating Footboards for Industrial Use



The Heating Footboards for Industrial Use by Thermal Technology® are designed to provide warm islands for people working in cold environments.

If used in large spaces such as industrial buildings, heating can be limited to some particular areas only.

Thanks to their special construction, the usable heat flow is optimised and heat loss towards the existing floor is minimised. This results in substantial operating cost reductions.

Heating footboards of this type are especially recommended for intermittent operation. In fact, they are not designed to heat the air of the whole environment.

Footboard temperature can be controlled by sensors connected to an electronic unit.

This heating system is maintenance-free (no boilers, no pumps, no water pipes).

Heating footboards are available in standard sizes or custom built.

### CONSTRUCTION:

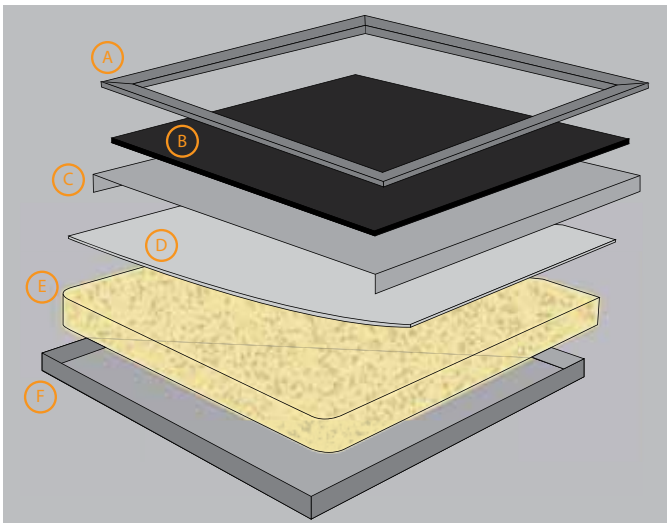
- Carbon fibre heating cables introduced between several layers of reflective, heat-conducting, and insulating materials.
- Max. surface temperature: 30°C.

### LAYER ANALYSIS:

- A. Aluminium frame.
- B. PVC finish (fire-resistance class 1).
- C. Zinc-plated steel sheet.
- D. Carbon fibre heating board.
- E. 20 mm thick extruded polystyrene heat insulation.
- F. Steel sheet bottom.

### SPECIFICATIONS:

- Carbon fibre resistors
- Voltage: 230 VAC
- Absorption: 200 W/m².
- Dimensions: see table.
- Thermostat: temperature adjustment by separate electronic control (max. surface temperature: 30°C).
- Marking: CE.
- Protection level: IP40
- Guarantee: 24 months (see User Manual).



Code	Product
PEDI.E	Heating footboard 97x97 cm 200W
PEDI.D	Heating footboard 197x97 cm 400W
PEDI.X	Custom-built heating footboard 200W/m²
T602.C	Temperature control unit with IP68 protected circular connector

# Radiant Ceiling Panels

Showroom



Meeting room in a villa



Restaurant



Workplace



The Radiant Ceiling Panels by Thermal Technology® are extremely versatile: whether integrated in false ceilings, fixed to the ceiling or mounted hanging at a definite height, they can be easily removed and re-used. Radiant Heating Panels are ideal to heat individual areas or workplaces in large environments such as workshops, warehouses, laboratories, kiosks or patios of public places (pubs, restaurants, etc.).

Radiant panel heating results in energy savings as all the irradiated energy is streamlined to heat persons, the floor, the walls, and objects. Air is only heated indirectly. The system is power operated and therefore exempt from legal requirements including certifications from Local Health Authorities or from the Fire Brigade. As no combustion is involved, the system does not need any exhaust outlets, boiler houses or fume emission compliance certificates.

## RADIANT HEATING

Practical, lightweight heating panels are easily installed. Purchasing, installation and operating costs are extremely competitive compared to any other type of similar systems including hot-water radiant strips, radiant gas heaters, thermal umbrellas, etc. Heating elements have a very low thermal inertia and this contributes to fastening the heating process. No assistance or maintenance needed, no permissions to apply for and no specific regulations to conform to.

## TEMPERATURE CONTROL

The system can be controlled by clock-timers and sensors or by a consumption-limiting electronic unit which optimises operating costs.

## APPLICATIONS

Typical installations include workplaces.

Radiant heating panels are ideally installed above the operator or above busy places. They are also suitable for heating offices, and can be installed even in breeding farms.

## INSTALLATION

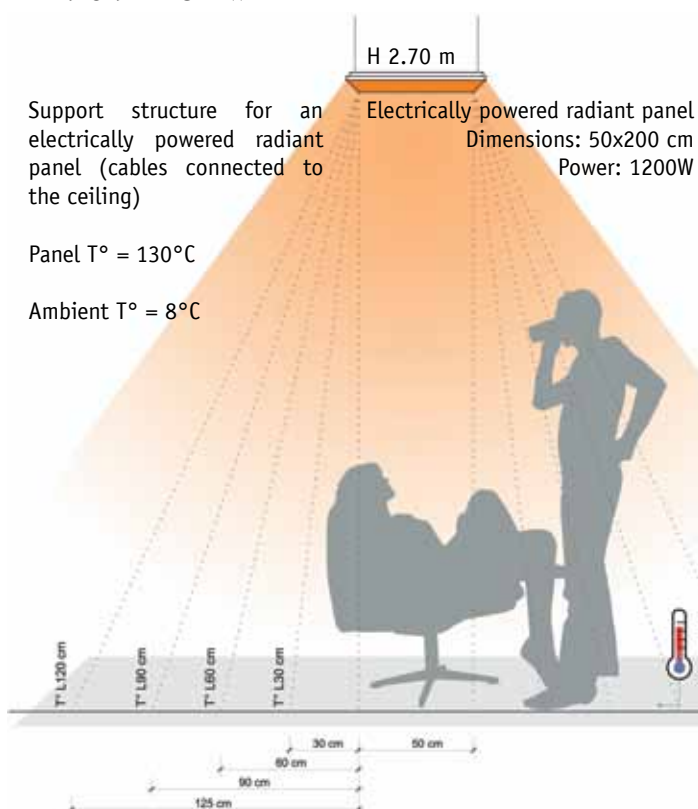
A Radiant Heating Panel is to be mounted at a certain height with the radiant surface facing downwards. Recommended installation height: 2.30 m with seating persons; 2.70 m with standing persons. Under special circumstances heating panels may also be installed at different heights (please refer to the manufacturer). Radiant Heating Panels are provided with 4 hooks for ceiling mounting.



## False ceiling heating panels



## PERFORMANCE EXAMPLE



## PRS1

60x60 cm panels are only delivered with the 250 Watt power option and are ideal for trade and business centres.

### SPECIFICATIONS:

- Size: 59.9x59.9 cm.
- Voltage: 230 VAC
- Power: 250W.
- Protection level: IP54.
- Weight: 5 kg.
- Max. surface temperature: 110°C

## PRS2

200x50 cm panels have three workload options.

### SPECIFICATIONS:

- Size: 200x50 cm.
- Voltage: 230 VAC
- Power: 1200W (400W/800W/1200W).
- Protection level: IP54.
- Weight: 11.5 kg.
- Max. surface temperature: 110°C/130°C depending on ambient conditions.

Code Radiant ceiling panels	Dimensions (cm)	Power
PRS1.A.000.2A2	59.5x59.5	250W
PRS2.A.000.2A2	200x50	1200W

Flooring type	T° L0 cm	T° L30 cm	T° L60 cm	T° L90 cm	T° L120 cm
Ceramic tiles / Concrete floor	24°C	23°C	20°C	20°C	18°C
Wood slabs / pre-finished	29°C	26°C	24°C	22°C	20°C

# Custom-Made Heating Blankets



Thermal Technology® manufactures custom-made carbon fibre Heating Bands and Insulation Covers, which come either as standards or in small quantities or prototypes. Optional features include power, size, and voltage (mains voltage or low voltage 12/24/48V).

Our heating bands and covers are versatile and particularly suited for industrial, private or civil engineering use, or to heat small, low-temperature sensitive tanks, pipes or mechanical parts.

Also useful in the processing of plastics or other types of materials, they are flexible and resistant and adhere entirely to the surface to be heated. They can be easily adapted to fit pipeline holes, inspection holes and the like thanks to their special velcro straps.

Our heating bands and covers are made of polyesters and aramid materials (e.g. Kevlar) and can be designed for temperature ranges up to 200°C. They can be delivered with a bi-metal precision thermostat-based temperature control (40/60/80/90°C +/-5 ) or used with standard temperature control units available in the market. In this case, they are delivered with NTC probes, K thermocouples or PT100 probes.





## PORTFOLIO





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